

Serial No.: 09/821,820

Filing Date: March 29, 2001

Attorney Docket No. 100.763US01

Title: OPERATIONS AND MAINTENANCE ARCHITECTURE FOR MULTIPROTOCOL
DISTRIBUTED SYSTEM

REMARKS

The Office Action mailed on January 24, 2005 as well as the art cited has been reviewed. Claims 1-14 are pending in this application.

Summary of Examiner Interview

On August 18, 2005, the Primary Examiner contacted David Fogg (Registration Number 35,138) by telephone, inquiring about the status of a response to the Office Action mailed January 24, 2005 in the present application.

On August 18, 2005, in response to this inquiry, the undersigned telephoned the Primary Examiner to discuss the status of a response to the outstanding Office Action. The undersigned indicated that Applicants' failure to timely respond to the outstanding Office Action was unintentional and that Applicants intended to revive the application. There was no dispute as to the abandoned status of the present application due to the failure to file a timely response to the outstanding Office Action and the Examiner advised Applicants to file a petition to revive under 37 C.F.R. 1.137 (accompanied by the appropriate petition fee) as necessary to revive the application abandoned application.

Objections to Specification

The Office Action objected to the abstract and indicated that the Abstract should be 150 words or less. The Abstract has been amended to address this objection. Accordingly, it is respectfully requested that this rejection be withdrawn.

The Office Action also objected to the Specification due to the informality on page 12 concerning a reference to a common assignee application. The Specification has been amended to address this objection. Accordingly, it is respectfully requested that this rejection be withdrawn.

Serial No.: 09/821,820

Filing Date: March 29, 2001

Attorney Docket No. 100.763US01

Title: OPERATIONS AND MAINTENANCE ARCHITECTURE FOR MULTIPROTOCOL DISTRIBUTED SYSTEM

Objections to Claims

The Office Action noted informalities with claims 1, 7, and 10. Claims 1, 7, and 10 have been amended to address these informalities. Accordingly, it is respectfully requested that these objections be withdrawn.

Allowable Subject Matter

Claims 3 and 12 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Rejections Under 35 U.S.C. § 112

The Office Action rejected claim 7 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Office Action took the position that the claim contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The Office Action stated that it is not clear where in the disclosure a written description of the following can be found: “accepting requests for distribution services from multiple tenant service providers, the requests specifying a desired air interface for wireless communication from among a plurality of available air interfaces, and an indication of which portions in the coverage area the particular air interface is to be supported.”

Applicants respectfully traverse this rejection. For example, support for this feature can be found, for example, in page 8, line 27 - page 10, line 18 and page 13, line 26 - page 14, line 15:

An operator controlled, common or open access Network Management System 60 provides remote monitoring and control of the open access network 10 by the network operator. The open access Network Management System 60 also allows for the network operator to pass selected control or status information

Serial No.: 09/821,820

Filing Date: March 29, 2001

Attorney Docket No. 100.763US01

Title: OPERATIONS AND MAINTENANCE ARCHITECTURE FOR MULTIPROTOCOL DISTRIBUTED SYSTEM

concerning the open access network 10 to or from the individual wireless carriers or tenants. The present invention relates in particular to the manner in which the open access NMS 60 communicates with tenant NMSs 62a, 62b. By "tenant" herein, it is meant to refer to the wireless carrier, Wireless Service Provider (WSP), or other business entity that desires to provide wireless service to end customers using the open access system 10.

The open access system 10 supports essentially any wireless protocol to be an open access platform. In one configuration, open access system 10 supports the multiple 800/1900 MHz and/or WCS/ISM/MMDS/U-NII wireless service providers, and wireless data providers who require last mile access to their targeted customers, all at the same time.

In a preferred configuration, the open access network consists of radio access nodes (RAN) 50 distributed to achieve the desired RF signal presence and a hub 35 and high speed data link 40, which interconnects the base station RF signals with the RANs 50.

The distributed architecture is comprised of multi-protocol, frequency-independent radio access nodes 50. In the preferred embodiment at the present time, each RAN 50 supports from 1 to 8 tenants of various protocols and frequencies. It should be understood that other configurations could support a smaller or greater number of tenants per RAN 50. Within each RAN 50, the wireless service provider "tenants" have typically leased space from the operator of the open access system 10, so that the operators can install corresponding, appropriate individual radio elements in a RAN slice 52. Each HUB 35 can scale to support one to three sectors each for multiple base stations 20. It should be understood that base stations with a greater number of sectors 20 may also be supported.

RANs 50 are interconnected via fiber links 40 to centrally located HUB sites 30 and associated base stations 20. RANs 50 provide a wide area distribution network that is logically a "horizontal radio tower" with access provided to a single "tenant" or shared amongst multiple tenants (wireless service providers). The generic architecture supports scaling from a single operator to supporting up to multiple operators across the multiple frequency bands per

Serial No.: 09/821,820

Filing Date: March 29, 2001

Attorney Docket No. 100.763US01

Title: OPERATIONS AND MAINTENANCE ARCHITECTURE FOR MULTIPROTOCOL DISTRIBUTED SYSTEM

shelf. Multiple slices may be stacked to serve additional tenants, as needed.

Open access network elements such as the HUBs 35 and RANs 50 incorporate a System Network Management Protocol (SNMP) communication scheme to facilitate integration with the host operator's open access network management system (NMS) 60. The open access NMS is in turn connected to tenant-specific NMSs 62a, 62b through convenient data networking equipment such as wide area data networks (WANs) 65. This architecture allows easy and complete communication across the open access system 10 with a high level of control and visibility. The preferred manner in which the open access NMS 60 coordinates requests from tenant NMSs 62a, 62b to communicate SNMP messages with the open access system elements is described below.

* * *

The hub interconnect in FIG. 5 then selects RAN 50 simulcast groupings for each sector based upon the desired groupings desired for each tenant. This permits for equalization of the radio frequency link budgets in each RAN 50 group. The open access product allows a tenant to customize the RAN 50 RF parameter settings to control the radio link environment, such as signal attenuation, gain, and other methods for strong signal mitigation.

In sector configuration of the system, the Hub/RAN ratio is configurable from 1 to 8 RANs per BTS sector. The RANs 50 is remote configurable through the open access operator's NMS 60, to support what is commonly referred to as sector reallocation. The sector allocation is defined by the hosted wireless service provider's traffic loading analysis and controlled by the inputs from the specific tenant's NMS 62 via the wide area network 65.

What is important to note here in the context of the present invention is that any given WSP or tenant may require access to only certain ones of the RAN slices at particular RANs 50, depending upon the simulcast configuration presently in place, and depending upon the types and amount of access that the individual tenant has requested from the operator of the open access system.

Accordingly, it is respectfully requested that this rejection be withdrawn.

Serial No.: 09/821,820

Filing Date: March 29, 2001

Attorney Docket No. 100.763US01

Title: OPERATIONS AND MAINTENANCE ARCHITECTURE FOR MULTIPROTOCOL DISTRIBUTED SYSTEM

Rejections Under 35 U.S.C. § 102

Claims 1-2, 5-11 and 14 were rejected under 35 USC § 102(b) as being anticipated by Hamilton-Piercy et al., (U.S. Patent No. 5,802,173).

Applicants respectfully traverse this rejection. It is respectfully submitted that the Office Action fails to make a prima facie case of anticipation with respect to claim 1 of the present application.

Claim 1 of the present application, as amended, recites in relevant part "a first tenant base station operated by a first wireless communication service provider", "a second tenant base station operated by a second wireless communication service provider, and co-located with the first base station" and "a transport medium interface for converting radio frequency signals transmitted by the first and second base stations and control messages relating thereto to a common transport medium." Moreover, claim 1 further recites, in part, "a first tenant network management system operated by the first wireless communication service provider", "a second tenant network management system operated by the second wireless communication service provider", and "a common network management system that forwards control messages from the respective tenant network management system to the intended tenant slice modules associated with respective ones of the radio access nodes using the shared transport medium."

The Office Action took the position that Hamilton teaches:

a first tenant based station (207) at a "first tenant network management" system (OCMS) operated by a first wireless communication service" provider (col 3/lines 51-54, col 8/lines 53-67 and col 11/lines 30-35);

a second tenant base station (208) at a "second tenant network management" system (CCMS) operated by a "second wireless communication service" provider (col 3/lines 51-54, col 8/lines 53-67 and col 11/lines 30-35), wherein the second tenant and the first tenant are collocated (col 7 li[n]es 13-14, col 8, lines 53-67);

Office Action, paragraph 7.

Serial No.: 09/821,820

Filing Date: March 29, 2001

Attorney Docket No. 100.763US01

Title: OPERATIONS AND MAINTENANCE ARCHITECTURE FOR MULTIPROTOCOL DISTRIBUTED SYSTEM

In other words, the Office Action is apparently taking the position that the "optically connected microcell system" (OCMS) of Hamilton and the "coaxially connected microcell system" (CCMS) of Hamilton are "a first tenant network management system" and "a second tenant network management system", respectively, as recited in claim 1 of the present application. However, the Office Action contains no explanation as to why an "optically connected microcell system" or a "coaxially connected microcell system" is a "network management system" as set forth in claim 1. The cited portions of Hamilton contain no such explanation. The cited portions of Hamilton include the following:

As the urban mobile radiotelephony network matures, the ability of a cellular service provider to locate, construct and operate additional conventional RBS sites becomes increasingly difficult and costly. Site access for maintenance purposes, which may be required at any time, also becomes a problem. Finding a site in a building at the desired geometric grid point or desired coverage location does not guarantee success.

Column 3, lines 51-54 (and surrounding context).

The Optically Connected Microcell System (OCMS) or the Coaxially Connected Microcell System (CCMS) to be described is in effect a transparent low loss transmission system between RBS equipment, located at a common equipment site, and mobile radiotelephony units, which enables a much greater separation between radiotelephony mobile and the RBS equipment. Thus a multiplicity of Optically Connected Microcell Base Stations (OCMBS) and/or Coaxially Connected Microcell Base Stations (CCMBS) may be connected to the coaxial or optical fibre cable facilities throughout a community or urban centre to provide radiotelephony services, with the effect of providing virtual radio base stations at multiple sites, even though the radio base stations themselves may be concentrated in only a few, or even a single site.

Column 8, lines 53-67.

In FIG. 1, a fibre optical link 209 is shown connecting the RBS 207 to an Optically Connected Microcell Base Station (OCMBS)

Serial No.: 09/821,820

Filing Date: March 29, 2001

Attorney Docket No. 100.763US01

Title: OPERATIONS AND MAINTENACE ARCHITECTURE FOR MULTIPROTOCOL DISTRIBUTED SYSTEM

210. This remote OCMBS extends the service area of the RBS 207 as described further below so as to enable it to provide a radio link with the mobile 206. Alternatively a coaxial cable transport link 245 to a Coaxially Connected Microcell System (CCMS) could also provide access to a remote location with the appropriate radio interface to the mobile. By using such links to provide locations for what are effectively virtual radio base stations, i.e. locations for what will appear to a mobile transceiver to be the site of a base station, a number of radio base stations can be co-sited or warehoused at a single location or Radio Base Station Warehouse (RBSW) 208, and a multitude of OCMS 210 or CCMS 247 can be interconnected through it to provide radio links to mobiles.

Column 11, lines 30-35 (and surrounding context).

It is respectfully submitted that these cited portions of Hamilton simply do not teach that either the "OCMS" or "CCMS" is a "network management system" as set forth in claim 1. In this regard, Applicants respectfully point out that the "MS" in the acronyms "OCMS" and "CCMS" refers to "microcell system" and not "management system" (as in "NMS").

Moreover, even if the OCMS and the CCMS can somehow be considered to be first and second tenant network management systems (which Applicants do not concede), Hamilton contains no teaching that the OCMS is "operated by the first wireless communication service provider" or that the CCMS is "operated by the second wireless communication service provider" as recited in claim 1. The portions of Hamilton cited in the Office Action contain no such teaching and the Office Action contains no explanation as to how Hamilton otherwise teaches this.

Accordingly, Applicants respectfully request that the rejection of claim 1 be withdrawn.

Claims 2, 5 and 6 all ultimately depend from claim 1 and the arguments set forth above with respect to claim 1 above. Therefore, for at least the reasons set forth above with respect to claim 1, it is respectfully requested that the rejection of these claims be withdrawn.

Serial No.: 09/821,820

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Title: OPERATIONS AND MAINTENACE ARCHITECTURE FOR MULTIPROTOCOL
DISTRIBUTED SYSTEM

The Office Action rejected independent claims 7 and 10 using the same rationale as claim 1. Also, claims 8-9 depend from claim 7 and claims 11 and 14 depend from 10. Accordingly, it is respectfully submitted that at least the arguments set forth above with respect to claim 1 apply to these claims as well. Therefore, it is respectfully requested that the rejection of these claims be withdrawn.

Serial No.: 09/821,820

Filing Date: March 29, 2001

Attorney Docket No. 100.763US01

Title: OPERATIONS AND MAINTENACE ARCHITECTURE FOR MULTIPROTOCOL
DISTRIBUTED SYSTEM

CONCLUSION

Applicant respectfully submits that claims 1-14 are in condition for allowance and notification to that effect is earnestly requested. If necessary, please charge any additional fees or credit overpayments to Deposit Account No. 502432.

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at 612-455-1681.

Respectfully submitted,

Date: 8/31/2005

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